[55] SEAT No._____ No. of Printed Pages : 2

SARDAR PATEL UNIVERSITY

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B. Sc. - 6th Semester (Instrumentation)

US06CINS04 (Programmable Logic Controller - II)

Day and Date: Monday, 01/04/2019

Time: 10:00 am to 01:00 pm

Maximum Marks: 70

Que 1 Objective Type Questions. **[10]**

1 ____: supply the clock (trigger) pulse for the D flip flops.
- **a)** One shot
- **b)** Timer
- **c)** Counter
- **d)** Sequencer

2 ____ is a monostable multivibrator with an output that is ON for a predetermined length of time.
- **a)** One shot
- **b)** Sequencer
- **c)** Flasher
- **d)** Off-delay timer

3 The length of time the ____ coil is ON depends on the scan time of the PLC.
- **a)** One shot
- **b)** Counter
- **c)** On-delay timer
- **d)** Timed sequencer

4 ____ Command tells the controller that the following set of contacts composes one branch of logic.
- **a)** LD
- **b)** STO
- **c)** ENTER
- **d)** OUT

5 The ____ command tells the controller that the previous logic is to control the coil that follows the STO command.
- **a)** STO
- **b)** LD
- **c)** ENTER
- **d)** AND

6 The termination command for a line of code is generally ____.
- **a)** OUT
- **b)** STO
- **c)** LD
- **d)** ENTER

7 ____ Outputs are used to control low power ac loads.
- **a)** DTL logic
- **b)** RTL logic
- **c)** TTL logic
- **d)** Triac

8 The ____ relay contact is a single pole double throw contact.
- **a)** FORM A
- **b)** FORM A and FORM B
- **c)** FORM B and FORM C
- **d)** FORM C

9 Standard bipolar analog input modules have ranges of ____.
- **a)** 0 to 5 VAC
- **b)** -100 to 0 VDC
- **c)** 0 to 5 VDC
- **d)** -5 to +5 VDC

10 The ____ of an A/D operation determines the number of digital values the converter is capable of discerning over its range.
- **a)** Precision
- **b)** Accuracy
- **c)** Voltage regulation
- **d)** Resolution

(P.T.O.)

Que 2 Short Questions (Attempt Any Ten) [20]

1. What is flasher?
2. Write on cascading timers.
3. Explain timed one shot.
4. Explain entering of normally closed contacts with necessary ladder diagram.
5. Draw the ladder diagram for a program that will accept inputs from switches IN1, IN2, IN3, IN4 and IN5 and will energize coil OUT123 when one and only one of the inputs in ON.
6. Draw the ladder diagram for exclusive-OR logic function.
7. Briefly explain output wiring.
8. Write briefly on solid state outputs.
9. Write on isolated inputs.
10. A temperature sensor outputs 0-10 volts dc for a temperature span of 0-100 ^{0}C. What is the bit resolution of a PLC analog input that will digitize a temperature variation of 0.1 ^{0}C?
11. A 10-bit bipolar analog input has an input range -5 to +5 volts. If the converter outputs the binary number 0110111101_2, what is the voltage being read?
12. Explain analog data handling.

Que 3 [A] Explain timed sequencer. [05]

[B] With necessary ladder diagram, explain RS flip flop. [05]

OR

[A] Write a detailed note on timers with necessary ladder diagrams. [10]

Que 4 [A] Draw ladder diagram of AND function. Write mnemonic codes for AND function. [05]

[B] Write a note on complex branches with necessary ladder diagram. [05]

OR

[A] Draw ladder diagram of OR function. Write mnemonic codes for OR function. [05]

[B] Write a note on simple branches with necessary ladder diagram. [05]

Que 5 [A] Write a detailed note on PLC input wiring with necessary diagrams. [10]

OR

[A] Give an account of PLC relay outputs with necessary diagrams. [10]

Que 6 [A] Discuss constant offset error and percentage offset error. [05]

[B] Write a note on analog (D/A) output. [05]

A 12-bit, 10 volt bipolar analog output has a maximum output current capability of 20 mA. It is connected to a load that has a resistance of 330 ohms. Will this system work correctly?

OR

[A] Enlist analog input potential problems. Explain unstable reading in detail. [05]

[B] Give an account of input range and number of bits of resolution with respect to analog (A/D) input. [05]

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